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ABSTRACT

A descriptive study was conducted in three junior high schools in Calgary (Alberta) to examine: (1) student attitudes toward computers, (2) student preferences for different kinds of software, and (3) student knowledge of computers and computer applications. Subjects (n=157) completed a survey designed to evaluate their attitudes and knowledge level. Findings indicated the following: more boys than girls reported feeling comfortable using computers; the gifted respondents reported enjoying computers more and finding them more useful; more boys than girls reported not having used the listed software; gifted students preferred the BASIC programming language whereas average students preferred LOGO; average children scored higher than gifted children on knowledge of hardware and software concepts; and boys scored higher than girls on hardware concepts. (DB)

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Attitudes Towards, Preferences For, and Knowledge Of Computers Among Gifted and Average Junior High Children

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Computer technology is advancing at an unbelievably fast rate. While industries, and businesses are at the forefront in using this technology, academic institutions seem to be rather slow in adopting it. Having said that, it is also true that some schools are requiring that their students use computers to benefit them. Since we as educators of computer uses in education teach about the applications in the school classroom, I felt that there is a need to examine the various attitudes children have towards computers, their preferences for and experiences with different kinds of software, and their knowledge of computers and its applications.

The Study: Its Purpose and Research Questions:

A study was conducted in 3 schools in Calgary to examine: a) attitudes towards computers; b) preferences for different kinds of software; and c) knowledge of computers and computer applications. This was an exploratory study. The research questions were:

1) What attitudes do junior high children have towards computers?
2) What software do the children in junior high classes prefer?
3) What is the extent of knowledge of computers among junior high children?

Methodology:

A Total of approximately 300 consent forms were sent to the 3 schools selected for this study. A total of 157 junior high children from the 3 schools in Calgary (one from the Public Board and 2 from the Catholic Board) volunteered to participate.

Variables and Procedures

Data about some background variables was collected. These were age, grade and gender. Research variables were:

a) Computer attitudes. A questionnaire about attitudes towards computers consisted of 15 items. These items were chosen from an attitude scale developed by Violato, Marini, and Hunter (1991) to assess the attitudes of preservice teachers. The items were statements referring to factors such as gender bias, value of computers, comfort level, and liking. Each statement could be responded to as strongly agree/agree/disagree/strongly disagree. Some examples of the statements are "I get confused when I sit in front of the computer", "Using computers is more important for girls than boys", "computers help me to learn". A few adaptations were made to tailor the items to junior high children.

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b) Preferences for different kinds of software: e.g., various programs such as Bank Street Writer, The Factory, and Newsroom. Names of 22 programs were categorized as wordprocessors, integrated packages (e.g., Appleworks) classroom publishing programs (e.g. Publish it), problem solving software (e.g., Factory, Gertrude's Puzzles), Computer-Assisted- Instructional programs, and programming languages (Logo, Basic). The 22 programs were to be rated on a 5-point Likert scale from "Like very much" (2) to Do not like at all (-2). A value of 3 indicated that the student had never used the program.

c) Knowledge of computers hardware and software: Sixteen true/false items were constructed to test knowledge of hardware and software. These items were statements much as "A computer screen helps to get a printout", "I can calculate how much pocket-money I get every month and how much I spend in a week with a spreadsheet program", and "The Keyboard helps to enter information into a database".

Findings of the Survey:

Since this was a descriptive study, findings of the survey will be reported purely as descriptive data. Overall, 157 students from Grades 7, 8 and 9 participated in the study. Ages ranged from 12-16 with a mean age of 13.3 years. There were 79 males and 66 females (12 students did not indicate their gender). Out of the 157 students, only 40 students were labelled gifted by the schools.

Attitudes towards computers

Table 1 is a summary of the statements and how they were responded to by gender and by gifted and average children. The 1st column beside the statements is the overall mean. The rest of the columns are percentage of students indicating agree or strongly agree to the statements. Note that statements 3, 6, 10 and 14 have a negative connotation. Statement 7 was intended as an enthusiasm item, hence a positive item, but it may have been taken as being negative. A dash (-) in every statement must be substituted by the word computer.

Table 1
Attitudes Toward Computers

		Overall Mean	Gender		Gift	
			Boys	Girls	Gifted	Average
1.	- are fun for me	3.1	86	84	82	81
2.	I like using -	3.3	92	91	95	91
3.	Confused in front of -	2.0	16	28	13	24
4.	- help in writing essays	3.0	75	49	82	70
5.	Girls and boys enjoy - equally	3.0	81	46	84	70
6.	Bored when I work on -	2.0	20	26	11	27
7.	Cannot stop working on -	2.4	47	36	44	40
8.	- are useful and necessary	3.5	95	97	95	97
9.	Job require - work	3.6	96	97	91	99
10.	More important for girls than boys	2.4	5	3	3	3
11.	- help me to learn	3.2	83	93	92	86
12.	Comfortable using -	3.2	91	87	89	88
13.	Will use - when grown up	3.4	91	95	99	91
14.	More boys than girls use - well	2.7	21	6	24	12

Preference for software

Table 2 summarizes the data for software preferences for gender and gifted/non gifted. As mentioned earlier, the Likert Scale "Like very much" to "Do not like at all" was applied to 22 programs. The table includes data for only those programs that showed a difference by at least 5 points on the gender and gift variables. The numbers in the cells are percentages of students who have never used the software (Column i) and percentages of students who like or like very much the software listed (Column ii). for a percentage of students who do not like or do not like at all, add columns i and ii and subtract from 100.

Table 2
Preference for Software

Software	Gender				Gift			
	Male		Female		Gifted		Average	
	I	II	I	II	I	II	I	II
Appleworks	22	53	23	68	36	39	18	66
Bankstreet Writer	72	20	58	38	62	23	66	31
Applewriter	71	18	56	40	72	18	62	32
Fredwriter	64	24	40	48	39	48	60	28
Publish It	89	8	81	19	-	-	-	-
Dazzle Draw	85	12	54	40	-	-	-	-
Newsroom	-	-	-	-	77	21	87	11
Any program to teach Math	17	61	9	81	8	74	16	67
Any program to teach Science	65	16	52	33	51	-	60	-
Any program to teach English	58	23	42	51	-	-	-	-
Programming language BASIC	37	43	50	37	44	51	41	35
Programming language LOGO	31	51	39	52	31	38	35	55

Knowledge of computers

The 16 True and False items were divided into items that referred to hardware concepts and items that referred to software concepts. Scores were computed for hardware and software concepts. A multivariate analyses of variance was worked out with hardware and software scores being the dependant variables and gift (average/gifted) and gender (male/female) being the independent variables.

The interaction between gender and giftedness was not significant in producing the differences in hardware and software scores. However, significant differences were found between the average and gifted children ($F=3.74$, $p=.027$). Univariate F values showed significant differences on both hardware and software concepts (Hardware: $F=6.007$, $p=016$; Software: $F=3.15$, $p=.078$).

Gender did not have a significant affect on the variation in scores on hardware and software. However, Univariate F value showed that some difference was seen between the genders on the scores on hardware ($F=4.303$, $p=.04$).

Discussion and conclusion:

As observed earlier, this was purely an exploratory study. The intention was not to generalize to a larger population or make definite causal relationships. The study was undertaken to describe the status as it exists.

Attitudes towards computers

Statements 3, 4, 5, 7, 11, & 14 seem to be responded to differently by boys and girls. Most noteworthy differences are found on Statements 4 (computers help in writing essays), 5 (Boys and girls enjoy computers equally) and 14 (More boys than girls use computers well), with boys agreeing more to these statements than girls. In general, it seems that more boys than girls feel comfortable using computers.

The gifted children and average children seemed to differ on their responses to Statements 3, 4, 5, 6, & 14. In general, the gifted children seem to enjoy computers more and find it more useful. Statement 14 (more boys than girls use computers well) is agreed to more by the gifted than the average children.

Preference for software

More boys than girls seem not to have used the software listed. Between the gifted and the average, there is considerable variation in preferences. More noteworthy is the difference in preference for programming languages BASIC and LOGO. Gifted students seem to like BASIC while average students like LOGO.

Knowledge of computers

Although the aim of working out these statistics are not to generalize to a larger population, the findings are of interest for further investigation. Significant differences were found between the average and gifted children on hardware and software concepts, with the average children scoring higher than the gifted. Boys scored higher than girls on the hardware concept.

This study formed the first part of a bigger study on development of talent in computers. From the results of this analysis, a total of 10 students will be selected to conduct an in-depth study of how development of talent in computers (specifically, development of skill in using a particular software) takes place.